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10/595,804	06/12/2006	Kiyotaka Matsuda	KOD177B.001APC	6973

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EXAMINER	
MOMPER, ANNA M	
ART UNIT	PAPER NUMBER
3657	

NOTIFICATION DATE	DELIVERY MODE
06/17/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/595,804	MATSUDA ET AL.	
	Examiner	Art Unit	
	ANNA MOMPER	3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *1* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendment to the claims received 2/27/2009 has been entered. Claims 2, 4, 6, and 10 have been amended.

2. The amendment to claim 2 has been found to overcome the previously made claim objection. Therefore, the objection to the claim in the office action dated 11/28/2008 has been withdrawn.

3. The amendment to claims 2, 4 and 6 have been found to overcome the previously made 112, 2nd paragraph rejections. Therefore the rejections to claims 2-9 under 112, 2nd paragraph in the office action dated 11/28/2009 has been withdrawn.

Response to Arguments

4. Applicant's arguments with respect to claims 2-3, 5, 7 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2-3, 5, 7, 10- 13 are rejected under 35 U.S.C. 103(a) as being obvious over Kimura (JP 10-184808 A) in view of Ueda et al. ("Noise and Life of Helical Timing Belt Drives") and further in view of Onoe et al. (US 4,790,802).

As per claim 2, Kimura discloses a helical synchronous belt (1) having core cords (2), and wherein a canvas (3) coats the external surface of the teeth and tooth gaps located between adjacent teeth (Fig. 1) configured to contact tops of pulley teeth, and wherein the core cords (2) are located just below the canvas (3, Fig. 1) such that the surface of the tooth gaps has irregularities created by the twisting of the core (Fig. 1, the belt as disclosed by Kimura has substantially the same structure as that disclosed by the applicant, see Fig. 4 of the instant application, therefore as irregularities are created by the cord twist and as the examiner understands, the cords proximity to the tooth gap surface, the belt of Kimura, while not disclosing irregularities would inherently have such irregularities as the structure is substantially the same, further irregularities and imperfections will exist in every instance, no matter what the physical structure) , and wherein all of the core cords being twisted in a single direction at an angle opposing to an angle of helical teeth (Fig. 2, core cords are twisted using an S-twist or Z-twist such that all wires are twisted in the same direction, and wherein the angle of twist of the core cords is opposing an angle of inclination 10a of the helical teeth).

Kimura fails to explicitly disclose the helical tooth angle set between 5° to 15°.

Ueda et al. discloses a helical synchronous belt having core cords (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 4-5) and a helical tooth angle set to 3, 5 or 10° (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 5-8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Kimura to include the helical tooth angle set between 5° to 15°, as taught by Ueda et al. for the purpose of reducing noise.

Modified Kimura fails to explicitly disclose a core cord twist angle set to 15° to 2°.

Onoe et al discloses an transmission belt (1) having reinforcement cords (6) and an equation to determine the twist angle of the reinforcement cords based on twists per 10 cm and diameter of the end load carrier to determine angle of twist, wherein this equation recites $\tan\gamma = \frac{(100/T_p)}{(\pi \times G_p)}$ where G_p is the diameter of the load carrier in mm and T_p is the twist in twists/10 cm (Fig. 1, Fig. 2, Col.3, Ln. 10-41). Onoe et al. does not explicitly disclose the core cord twist angle set to 15° to 2°, However, Onoe et al. discloses a relationship between oscillation of the belt and the angle of final twist (Fig. 7, Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to include a core cord twist angle set to 15° to 2°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Further, it would be obvious to change the core cord twist angle to reduce oscillation of the belt.

As per claim 10, Kimura discloses a helical synchronous belt (1) comprising:

a back layer (1a);

helical teeth (10) configured to be engaged with a pulley and arranged at a helical tooth angle (10a) which is formed by a tooth inclination line of each helical tooth and a line perpendicular to a longitudinal direction of the belt (Fig. 2);

core cords (2) embedded between the back layer and the teeth and aligned in the longitudinal direction of the belt for reinforcing the belt (Fig. 1), substantially all of said core cords being twisted in a single direction at a twist angle which is formed by a twist inclination line of each core cord and a line parallel to a longitudinal direction of the core cords and wherein a direction of the tooth inclination line and a direction of the twist inclination line are opposed to each other with respect to the line perpendicular to the longitudinal direction of the belt (Fig. 2, core cords are twisted using an S-twist or Z-twist such that all wires are twisted in the same direction, and wherein the angle of twist of the core cords is opposing an angle of inclination 10a of the helical teeth); and

wherein a surface between the helical teeth has irregularities created by the twisting of the core cords and configured to contact tops of the pulley teeth (Fig. 1, the belt as disclosed by Kimura has substantially the same structure as that disclosed by the applicant, see Fig. 4 of the instant application, therefore as irregularities are created by the cord twist and as the examiner understands, the cords proximity to the tooth gap surface, the belt of Kimura, while not disclosing irregularities would inherently have such irregularities as the structure is substantially the same, further irregularities and imperfections will exist in every instance, no matter what the physical structure).

Kimura fails to explicitly disclose the helical tooth angle set between 5° to 15°.

Ueda et al. discloses a helical synchronous belt having core cords (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 4-5) and a helical tooth angle set to 3, 5 or 10° (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 5-8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Kimura to include the helical tooth angle set between 5° to 15°, as taught by Ueda et al. for the purpose of reducing noise.

Modified Kimura fails to explicitly disclose a core cord twist angle set to 15° to 2°.

Onoe et al discloses an transmission belt (1) having reinforcement cords (6) and an equation to determine the twist angle of the reinforcement cords based on twists per 10 cm and diameter of the end load carrier to determine angle of twist, wherein this equation recites $\tan\gamma = \frac{(100/T_p)}{(\pi \times G_p)}$ where G_p is the diameter of the load carrier in mm and T_p is the twist in twists/10 cm (Fig. 1, Fig. 2, Col.3, Ln. 10-41). Onoe et al. does not explicitly disclose the core cord twist angle set to 15° to 2°, However, Onoe et al. discloses a relationship between oscillation of the belt and the angle of final twist (Fig. 7, Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to include a core cord twist angle set to 15° to 2°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Further, it would be obvious to change the core cord twist angle to reduce oscillation of the belt.

As per claim 3 and 11, Ueda et al. also discloses a helical tooth angle set to 5° or 10° (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 5-8).

Modified Kimura fails to explicitly disclose a core cord twist angle set to 10.2° or 4.8°. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to include a core cord twist angle set to 15° to 2°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Further, it would be obvious to change the core cord twist angle to reduce oscillation of the belt.

As per claims 5 and 7, Ueda et al. also discloses the use of the helical synchronous belt in a driving carriage (Pg. 274, "1. Introduction", Ln. 1-3).

As per claim 13, Modified Kimura fails to explicitly disclose no canvas formed on the helical teeth, however it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to not include a canvas, since it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. In re Karlson, 136 USPQ 184.

7. Claims 4, 6, 8-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable Kimura (JP 10-184808 A) in view of Ueda et al. ("Noise and Life of Helical Timing Belt Drives") and Onoe et al. (US 4,790,802) and further in view of Fujita (US 6,216,853).

As per claims 4, 6 and 12, Modified Kimura fails to explicitly disclose the core cords being made of aramid or glass fibers.

Ueda et al. further discloses the core cords being made of glass fiber (Pg. 274, "2. Forms and Dimensions of Test Belts and Pulleys", Ln. 4-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to further include the core cords being made of glass fiber, as taught by Ueda et al. for the purpose of selecting an appropriate material for the core cords.

Modified Kimura fails to explicitly disclose a back layer and teeth made of urethane resin.

Fujita discloses a toothed belt (1) having a body (1A) and teeth (2) being made from urethane resin (Col. 4, Ln. 17-24).

It would have been obvious to one having ordinary skill in the art at the time the invention to modify the belt of Modified Kimura to make the back layer and teeth of the belt made of urethane resin, as taught by Fujita, for increasing thermal and strength properties. Also note In re Leshin, 125 USPQ 416, and that it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claims 8 and 9, Ueda et al. also discloses the use of the helical synchronous belt in a driving carriage (Pg. 274, "1. Introduction", Ln. 1-3).

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura (JP 10-184808 A) in view of Ueda et al. ("Noise and Life of Helical Timing Belt Drives") and Onoe et al. (US 4,790,802) and further in view of Uehara et al. (JP 55-51148 A).

As per claim 13, Modified Kimura fails to explicitly disclose no canvas formed on the helical teeth.

Uehara et al. discloses a helical toothed transmission belt (Fig. 2) wherein there is no canvas on the toothed profile.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the belt of Modified Kimura to include no canvas on the helical teeth, as taught by Uehara et al., for the purpose of adjusting the friction between the belt and the pulley.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA MOMPER whose telephone number is (571)270-5788. The examiner can normally be reached on M-F 6:00-3:30 (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/
Primary Examiner, Art Unit 3657

am